

STAT 5401 Spring 2018  
**APPLIED MULTIVARIATE METHODS**  
University of Minnesota – Twin Cities

### Instructor and TA Information

INSTRUCTOR:	Dr. Kean Ming Tan	TA:	TBA
EMAIL:	<a href="mailto:ktan@umn.edu">ktan@umn.edu</a>	EMAIL:	<a href="#">TBA</a>
OFFICE:	357 Ford Hall	OFFICE:	TBA
HOURS:	1:30-3pm Th Or By Appointment	HOURS:	TBA

### Course Information

- TIME: MWF 11:15am–12:05pm  
LOCATION: Raphson Hall 43  
DESCRIPTION: You will learn when and how to apply popular multivariate methods, e.g., multivariate normal distribution, multivariate linear regression, principal components analysis, factor analysis, canonical correlations, discrimination and classification, clustering, and graphical modeling.  
REQUIRED: Official course prerequisites are STAT 5302 or STAT 8102.  
SUGGESTED: MATH 2243 (preferably MATH 4242). This course requires familiarity with linear algebra. If you have not had linear algebra, proceed at your own risk.

### Course Materials

- TEXTBOOKS: *Applied Multivariate Statistical Analysis, 6th* (Johnson & Wichern, 2007)  
Additional required readings may be posted to the course website.  
SOFTWARE: *R version 3.4.2* (available for free at <http://www.r-project.org/>)  
NOTES: *U of M Moodle* (available at <https://moodle.umn.edu/>)

## Grading

HOMEWORK: 30 points (best 6 of 7 assignments)  
MIDTERM I: 20 points (this will be an in class exam)  
MIDTERM II: 20 points (this will be a take home exam)  
FINAL: 30 points (this will be a take home exam)

A	B	C	D	F
90-100%	80-90%	70-80%	60-70%	<60%

Note: +/- will be added as appropriate.

## Homework

OVERVIEW: Assignments will require you to write R code, analyze real data, and *clearly* summarize your results.

SUBMISSION: Your answers and the associated R code should be submitted in the beginning of class. In an emergency, assignments can be emailed to the TA (in pdf).

POLICY: **Assignments are due in the beginning of class on the due date. Late submissions and resubmissions will not be accepted. Only best 6 of 7 assignments will be used in computing your grade. You may discuss the homework problems but you should write up the solution independently.**

## Midterm I (in class)

OVERVIEW: This in class midterm exam will include materials from the first 3-4 weeks of classes.

POLICY: **There will be no make-up exam without a documented, legitimate reason that is outside of your control. Social conflicts or a heavy workload are unacceptable excuses.**

## Midterm II (take home)

OVERVIEW: A longer and more in-depth assignment that will require you to conduct a comprehensive analysis and report on a real data set.

SUBMISSION: Same as submission of homework assignments.

POLICY: **The midterm will be due in the beginning of class on the due date. Late submission and resubmissions will not be accepted. You MAY NOT collaborate on the take home midterm exam. You will receive a 0 in the take home midterm exam if the instructor/TA finds out that you participate in any form of collaboration. Academic misconduct will be reported to the Office of Student Conduct and Academic Integrity.**

## Final

OVERVIEW: A longer and more in-depth assignment that will require you to conduct a comprehensive analysis and report on a real data set.

SUBMISSION: Submit your answers and the associated R code to the instructor's mailbox.

POLICY: **The final exam will be due at 5pm on the due date. Late submission and resubmissions will not be accepted. You MAY NOT collaborate on the take home final exam. You will receive a 0 in the take home final exam if the instructor/TA finds out that you participate in any form of collaboration. Academic misconduct will be reported to the Office of Student Conduct and Academic Integrity.**

## Miscellaneous

INTEGRITY: Students must abide by the campus regulations and student conduct code; see <http://regents.umn.edu/policies/index>

DISABILITY: Students with disabilities requiring accommodations should contact the instructor as soon as possible; see <https://diversity.umn.edu/disability/>.

STRESS: UMN provides services for you to help manage your mental health and stress levels; see <http://www.mentalhealth.umn.edu>.

CHANGES: The content and requirements of this course and syllabus may be altered depending on the instructor's perception of the needs of the class. *See the course website for the current version of the course syllabus and schedule.*

## **Academic Honesty and Dishonesty**

The following definition of student academic integrity and scholastic dishonesty is slightly modified from the webpage of the University's Office for Student Conduct and Academic Integrity, <http://www.oscai.umn.edu>:

Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis.

*All School of Statistics teaching faculty are instructed to refer students who violate the policy for academic honesty and dishonesty to the Office of Student Conduct and Academic Integrity.* A student responsible for scholastic dishonesty can in addition be assigned a penalty up to and including an F or N for the course.

## **Recommendation Letter Policy**

As a general policy, the instructor *does not* write recommendation letters for any students who are currently enrolled in his course(s). Once you have completed the instructor's course (and your final grade is available), it is acceptable to ask for a recommendation letter.

However, it is best to obtain recommendation letters from faculty members that you have worked with outside of a classroom setting, e.g., as a research assistant. If you do not have any non-classroom interaction with the instructor and/or have not been an active participant in this course, the instructor will not be able to write you a strong recommendation letter.